

We claim:

- Sub A> 1. A self-aligning coupling for mating a pair of axial arranged first and second flanged fittings, the coupling comprising:
- (a) first and second arms adapted for pivotal connection to one another, and having open and closed relative pivotal positions in use; and
- 5 (b) a rotational assist mechanism adapted to mechanically synchronize the closing of the first and second arms relative to a pair of flanged fittings to be connected in use, and further adapted to provide motion between the first arm and the second arm to receive and secure the second flanged fitting.
2. The self-aligning coupling of claim 1, further comprising a seal for providing sealed fluid communication between the first flanged fitting and the second flanged fitting.
3. The self-aligning coupling of claim 1, further comprising an interior surface having a conical self-alignment portion adapted to orient the second flanged fitting relative to the first flanged fitting.
4. The self-aligning coupling of claim 3, wherein the self alignment portion is adapted to orient the two flanged fittings from a maximum of about 10° of angular misalignment therebetween.
5. The self-aligning coupling of claim 1, further comprising a fastener for further securing the arms in a closed position.
6. The self-aligning coupling of claim 5, wherein the first and second arms further comprise outwardly extending ears having apertures for receiving the fastener.
7. The self-aligning coupling of claim 5, wherein the fastener comprises a C-clamp.
8. The self-aligning coupling of claim 1, further comprising a garter spring arranged to normally bias the arms toward the closed position.

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9. The self-aligning coupling of claim 8, wherein the first and second arms further comprise a garter groove to at least partially receive the garter spring in use.
10. The self-aligning coupling of claim 1, further wherein each half comprises a single mating groove adapted to receive the flanges of the two aligned fittings in use.
- ~~11.~~ The self-aligning coupling of claim 1, wherein said rotational synchronizer comprises interlocking teeth.
- ~~12.~~ The self-aligning assembly of claim 1, further comprising at least one cam shaped nub located along an interior surface of at least one coupling arm.
13. A self-aligning coupling for mating a pair of axial arranged first and second pipes, the mating ends of the first and second pipes having first and second flanged fittings, respectively, the self-aligning coupling comprising:
- 5 (a) a first arm having a base end and a receiving end, the first arm base pivotally connected adjacent to the first flanged fitting in use; and
- (b) a second arm having a base end and a receiving end, the second arm base pivotally connected adjacent to the first flanged fitting in use, wherein the second arm base ^{end} engages the first arm base ^{end} whereby the receiving ends of the arms can be synchronously moved between an open position and a closed position to receive and secure the flanged fitting of the second pipe.
- 10 14. The self-aligning coupling of claim 13, wherein at least one of said arms further comprises a self-alignment surface wherein the self-alignment surface angularly aligns the second flanged fitting with the first flanged fitting in the closed position.
- ~~15.~~ The self-aligning coupling of claim 13, further comprising a nub located along an interior surface of at least one coupling arm.
- ~~16.~~ The self-aligning coupling of claim 13, further comprising at least two nubs along an interior surface of each coupling arm.

17. The self-aligning coupling of claim 16, wherein at least one of the nubs comprises a cam shape adapted to facilitate alignment of the second flanged fitting in a closed position.
18. The self-aligning coupling of claim 13, wherein the first flanged fitting comprises pivotal projections extending radially outwardly and adapted to pivotally affix the first arm and the second arm thereto in use.
19. The self-aligning coupling of claim 13, further comprising a mating groove at least partially defined by a portion of each arm.
20. The self-aligning coupling of claim 19, further comprising a seal disposed within the mating groove in use.
21. The self-aligning coupling of claim 13, wherein each arm base further comprises recesses adapted to pivotally connect the first and second arms to the pivotal projections on the first flanged fitting.
22. The self-aligning coupling of claim 21, wherein the recesses comprise slotted grooves for selectively affixing the first and second arms to the pivotal projections on the first flanged fitting.
23. The self-aligning coupling of claim 13, further comprising a gear assembly adapted to provide the synchronous movement of the first and second arms in use.
24. A self-aligning coupling for mating a pair of corresponding flanged fittings, comprising:
- (a) a pair of arms adapted for pivotal connection between open and closed positions, the arms at least partially defining a mating groove adapted to receive at least portions of a pair of flanged fittings to be coupled; and
- (b) a rotational assist mechanism linking the arms and adapted to move the arms such that the flanged fittings can be received in the mating groove as the arms are effectively pivoted to a closed position.

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25. The self-aligning coupling of claim 24, wherein the rotational assist mechanism comprises first and second interacting members adapted to mechanically synchronize rotational orientation of the two arms as they are pivoted in use.
- ~~26.~~ The self-aligning coupling of claim 25, wherein each of the first and second interacting members are formed integrally with the first and second arms, respectively.
- ~~27.~~ The self-aligning coupling of claim 25, wherein the first and second interacting members comprise one or more tooth-like structures.
- ~~28.~~ The self-aligning coupling of claim 25, wherein the interacting members comprise gear elements.
- ~~29.~~ The self-aligning coupling of claim 24, wherein the first and second arms further comprise pivot recesses corresponding with one or more projections of a flanged fitting to be connected, said pivot recesses facilitating pivotal movement of said arms into an aligned closed position in use.
30. The self-aligning coupling of claim 24, further comprising a clamp selectively affixing said first and second arm in the closed position.
31. The self-aligning coupling of claim 24, wherein the first and second arms are hingedly oriented in a clamshell arrangement relative to one another in use.
- ~~32.~~ The self-aligning coupling of claim 24, further comprising a self alignment surface configured to direct the second flanged fitting toward the mating groove.